News Release

Two professors from the U of M Crookston take on the fight against staph infections; Research designed to discover extracts from plants to aid in the fight

By ltollefs on Friday, February 4, 2011

Two University of Minnesota, Crookston professors are leading the fight in the war on germs. The duo is working on research to discover compounds to combat Staphylococcus (staph) bacteria, a type of germ common to even healthy individuals, but harboring the potential to cause serious infections.

In order for Assistant Professor Venu Mukku (in photo, on left) and Associate Professor Brian Dingmann (in photo, on right) to conduct their research, the campus installed a level 2 biological safety cabinet purchased with help from a University of Minnesota Grant -In-Aid. Early research, using the facilities at RiverView Health in Crookston, began in August 2009. Because the Crookston campus lacked the necessary facilities, the partnership between RiverView Health and the U of M, Crookston was invaluable to Professor Mukku and his research.

"It is quite likely we would not have been awarded the Grant-In-Aid without the preliminary work Dr. Mukku conducted at RiverView," Dingmann explains. "The grant process is very competitive and having access to the facilities at the hospital was imperative for Dr. Mukku's research, in fact, it would not have been possible without it."

The research involves infecting worms with the pathogen of interest and checking the efficacy of various natural product extracts. Based on historical drug discovery statistics the researchers believe that the next antibiotic is waiting to be discovered from Mother Nature. The biological safety cabinet allows the research to be conducted in a safe environment.

Pat Fall, director of laboratory services at RiverView, worked closely with Mukku and Dingmann to coordinate the lab's use. "We used the lab before 8 a.m. or after 3 p.m. so our work would not interfere with the hospital's use of their lab," Mukku explains. "I am extremely grateful to Pat and to RiverView Health for extending their facilities to facilitate our work."

Background on MRSA

Over time, Methicillin-resistant Staphylococcus aureus (MRSA) infection, caused by a strain of staph bacteria, has become resistant to the antibiotics used to treat ordinary staph infections. Dingmann, who teaches microbiology, and Mukku, who teaches organic chemistry, teamed up to examine plant extracts that might possess antibacterial activity. The chemistry of natural products is a primary area of research for Mukku. He teaches organic chemistry and biochemistry on the Crookston campus. Dingmann provides the necessary expertise in microbiology. Together, the two will develop a library of plant and microbial extracts that could be tested in different biological assays in future, but for now, they will work to find solutions for fighting staph infection.

"There is a wealth of data in scientific and traditional literature about the medicinal properties of plants in and around Minnesota," Mukku explains. "We will examine extracts of different parts of those plants such as seeds, leaves, and bark for their efficacy in curing worms infected with different strains of staph. We will pursue a process known as bio-assay guided fractionation with the intent of isolating and characterizing compounds with activity."

Involved with Mukku and Dingmann are students Shawn Friedland, a senior biology major from Melbourne, Fla., and Heather Donati-Lewis, a senior pre-veterinary medicine major from Narcoossee, Fla. The students work with the extraction process as well as other phases of the research. Students are encouraged to work directly with faculty on research projects in order to gain with experiential learning.

Today the University of Minnesota, Crookston delivers 29 bachelor's degree programs, 18 minors, and more than 40 concentrations, including several online degrees, in the areas of agriculture and natural resources; business; liberal arts and education; and math, science and technology. With an enrollment of about 1,300 undergraduates from more than 25 countries and 40 states, the Crookston campus offers a supportive, close-knit atmosphere that leads to a prestigious University of Minnesota degree. "Small Campus. Big Degree." To learn more, visit www.umcrookston.edu.

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